

Notice of Allowability

Application No.

10/544,296

Examiner

Henry S. Hu

Applicant(s)

AMEMIYA ET AL.

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment of October 26, 2006.
2. ☒ The allowed claim(s) is/are 1-11.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

1. Applicants' **Amendment** filed on October 26, 2006 was received. **Claim 1** was **amended**, while no claim was cancelled or added. To be more specific, parent **Claim 1** was amended to narrow down the molar range of perfluoromethyl vinyl ether (PMVE) as monomer (a) to "**20.5-22.5**" from "20-23". Applicants allege on page 4 of Remarks that the support is on page 7 at line 18-23 in specification. **Claims 1-11** with one independent claim (Claim 1) are now pending. An action follows.
2. Claim rejections under 35 USC 103 in the previous Office Action dated May 30, 2006 are now removed for the reasons given in paragraphs 3-9 thereafter.

Allowable Subject Matter

3. Claims 1-11 are allowed.
4. The following is an examiner's statement of reasons for allowance: The above claims 1-11 are allowed over the closest references:
5. The limitation of parent **Claim 1** of the present invention relates to **a fluororubber sealant composition** comprising: 100 parts by weight of a fluororubber, which is a copolymer

Art Unit: 1713

having a crosslinking site derived from a bromine-containing and/or iodine-containing compound, capable of crosslinking with peroxide and having a component unit composition comprising: (a) "20.5-22.5%" by mol of perfluoromethyl vinyl ether, (b) 60-70% by mol of vinylidene fluoride, (c) 10 to 20% by mol of tetrafluoroethylene, (d) 0 to 10% by mol of hexafluoropropylene (based on 100% by mol of the total of the component units (a) to (d)), and (e) a small amount of a bromide and/or iodide unsaturated fluorohydrocarbon component unit as crosslinking site; and, based on 100 parts by weight of the fluororubber, 2 to 50 parts by weight of a bituminous fine powder; 0.5 to 6 parts by weight of an organoperoxide; and 1 to 10 parts by weight of a polyfunctional monomer.

See other limitations of dependent Claims 2-11.

6. In view of the Applicants' amendment, the twice-amended parent **Claim 1** of present invention relates to a "peroxide-curable" fluororubber sealant composition comprising two components as: (A) a fluororubber and (B) a specified mixture made of three components including a bituminous fine powder, an organoperoxide and a polyfunctional monomer.

The fluororubber in component A is either a **tetrapolymer of PMVE/VDF/TFE/HFP** or a **terpolymer of PMVE/VDF/TFE**, while small amount of Br- or I-containing co-monomer is always additionally included for use as crosslinking cite inside fluororubber A. With current amendment, such a fluororubber now carries a smaller molar range of perfluoromethyl vinyl ether (PMVE) for monomer (a) at "20.5-22.5", which is slightly narrowed down from original range of "20-23".

Art Unit: 1713

7. In a very close examination, the instant molar amount for fluororubber is as follows:

“20.5-22.5%” for perfluoromethyl vinylether, 60-70% for vinylidene fluoride, 10 to 20% for tetrafluoroethylene, and 0 to 10% for hexafluoropropylene. As exactly pointed out by Applicants on page 5 of Remarks as well as **Exhibit A** which is newly submitted, **none** of three primary references including **Albano, Kaspar and Grootaert** has disclosed such a **combination of molar ratio for four monomers including PMVE, VDF, TFE, and/or HFP.** For instance, Albano use TFE in the higher range of 33-75 mol%, Kaspar use PMVE only in lower amount of 1-20 mol%, and Grootaert needs to use higher or lower PMVE at 33.5 or 10.6 mol% while using very high amount of TFE at 65.1 or 70 mol%.

8. Although **carbon black** has been used as filler or additive in the curable composition, **each reference is silent about the addition of bituminous fine powder.** Each of two secondary references including **Schmiegel and Apotheker** only discloses that in the course of making peroxide-curable fluorinated composition, bituminous coal (Austin black) can be used together with carbon black (MT). By doing so, such filler mixture can be useful in the manufacture of cured articles so as to have many unique properties as specified. In some working cases, bituminous coal (Austin black) or carbon black (MT) can be used alone. Therefore, **Schmiegel and Apotheker in combination or alone cannot fix the deficiency of primary references in 103 rejection.**

9. It is known in the art that even the difference is only one carbon atom in the composition or a tiny extra step in making, the final polymeric products can be with very much different

Art Unit: 1713

properties. Additionally, the present invention has shown in examples along with some comparative examples for unexpected results in preparing such a peroxide-curable fluororubber sealant composition (see pages 20-27 for **examples 1-2** along with its **comparative examples 1-8**, and **Table 1**). Therefore, all the above-mentioned references, in combination or alone, does not teach or fairly suggest the limitations of present invention.

10. After further examination and search, the examiner found the following prior art did not teach the claimed limitation:

USPG-PUB 2004/0037967 A1 to Feiring et al. only discloses a coating system useful for plastic substrate. Such a coating system consists of terpolymer of VDF/TFE/PMVE (abstract, line 1-4; paragraphs 3-5). VDF is used in 12-60 mol% (paragraph 0004) which is less than the claimed 60-70 mol%. However, **bituminous component and the polymer with Br- and/or I-containing cure-site are NOT disclosed or suggested for peroxide curing**. Therefore, Feiring fails to teach or fairly suggest the sealant composition of present invention.

US 6,613,846 B2 to Hintzer et al. only discloses a peroxide-curable fluoroelastomer composition comprising hydrosiloxanes or hydro silazanes. The fluoroelastomer may carry A Br- or I-containing cure site and may carry monomers of TFE, VDF and PMVE (column 5, line 58; abstract, line 1-12; column 4, line 23-33). However, **bituminous component is NOT disclosed or suggested for peroxide curing**. Additionally, the combination of molar ratio

Art Unit: 1713

for monomers PMVE, VDF and TFE is NOT disclosed at all. Therefore, Hintzer fails to teach or fairly suggest the sealant composition of present invention.

11. The key issue in preparing the claimed peroxide-curable fluoroelastomer composition by comprising **a fluororubber** (with specific amount of **PMVE, VDF, TFE and HFP**) and a **specified mixture made of a bituminous fine powder, an organoperoxide and a polyfunctional monomer**, cannot be overcome by any or the combination of the above references, therefore, the present invention is novel.

12. As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the above references to render the present invention anticipated or obvious to one of the ordinary skill in the art. Therefore, the independent and parent **Claim 1** is allowed for the reason listed above. Since the prior art of record fails to teach the present invention, the remaining pending dependent **Claims 2-11** are passed to issue.

13. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance".

Art Unit: 1713

14. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu** whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Henry S. Hu

Patent Examiner, Art Unit 1713, USPTO

December 20, 2006



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